

Birds with Silviculture in Mind

Birder's Dozen Pocket Guide for Massachusetts Foresters

Identification tips, ecological information, and management options for 12 priority forest bird species.

Adapted from Vermont's Foresters for the Birds Project

Adapted by Mass Audubon from *Birds with Silviculture* in *Mind: Birder's Dozen Pocket Guide for Vermont Foresters*. ©2011 with permission and assistance from Audubon Vermont.

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Introduction

This guide is designed to assist foresters who are interested in silviculture that integrates timber and songbird habitat management in Massachusetts.

Information provided here is intended to support both the creation of Stewardship and Current Use (Ch61, Ch61A, Ch61B) forest management plans and subsequent implementation of on-the-ground, stand-level management activities that can benefit breeding bird populations while producing timber products.

This guide has been adapted from the Vermont Foresters for the Birds Project in consultation with Audubon Vermont. The original Vermont Foresters for the Birds Toolkit was a collaborative project between the Vermont Department of Forests, Parks, and Recreation and Audubon Vermont. This document was created for use in Massachusetts by staff at Mass

Audubon, the Massachusetts Department of Conservation and Recreation, and the Massachusetts Woodlands Institute.

In this guide, we provide considerations and tips for silvicultural options that have the potential to benefit the Birder's Dozen species, along with information on bird identification and habitat requirements. This guide is intended to be used in conjunction with its two companion documents: Forest Bird Habitat Assessment and Silviculture with Birds in Mind.

We assume users of these documents have experience in silviculture for timber production and an interest in managing for bird habitat as well. Our purpose is to provide relevant bird information and guidance on integrating bird habitat management concepts with accepted and widely applied silvicultural treatments.

The Birder's Dozen

The Birder's Dozen is 12 of the 40 mature and young forest breeding birds that have been identified by National Audubon as being high priorities for protection in the Northern Forest and the Eastern Deciduous Forest Regions (page 44). These 12 species were selected because they:

Are relatively simple to identify by sight and/or sound.

Collectively use a wide range of forest types and conditions for feeding and for breeding.

Are common in Massachusetts forests.

Have a significant portion of their global population breeding in the Northern Forest Region or the Eastern Deciduous Forest Region.

The Birder's Dozen is a great starting place for novice birders. It is also an excellent focal point for those who are interested in managing forests in MA with birds in mind.



How to use this guide

This guide is designed to be a quick field reference that is small enough to fit in your pocket and can be used during forest inventory, timber harvest, and operations. It is not a comprehensive field guide or a complete guide to the life history of these twelve species. This is also not a silvicultural guide. Instead, it is intended to provide a concentrated dose of bird-by-bird information that is of interest and value to those who manage forests in Massachusetts and want to do so with birds in mind.

ID Tips

Describes the most distinctive and identifying field marks for males of the species during breeding season.

Note that coloration and patterning often varies between males and females, juveniles and adults, and breeding and non-breeding adults.

Song

Describes the most common male song that is used during breeding season to attract a mate and/or defend a territory. Birds often sing more than one song, and individuals may have their own personal variations or regional dialects. Males and females also often have other vocalizations or calls that can be recognized with additional practice.

Habitat

Describes the preferred, highest quality, breeding habitat of the species where it is likely to have the greatest reproductive success. Birds often use lower quality habitat when high quality habitat is not available. Species may also change their habitat preferences during different life stages and seasons, such as after fledging, before and after breeding, and during migration.

Drawings of habitat features important to each species are provided, along with a simple breeding habitat schematic that highlights important attributes for a quick visual reference. A key to these habitat icons can be found at the end of the guide on pages 42-43.

Territory

Refers to the area a male defends during the breeding season. Territory size is often dependent on the quality of the habitat with smaller territories being possible in higher quality habitat. During the breeding season, some species may restrict their movements to staying entirely within their territories. However, most species require a larger area than their territory for foraging. Although potentially very useful for making management decisions, these area requirements are often difficult to calculate since they are dependent on so many variables.

Food

Refers to the main diet and foraging habitats and habits of the species during the breeding season. Birds' diets and foraging habits often vary during different life stages and seasons, such as after fledging, before and after breeding, and during migration.

Silvicultural Considerations

stand-level changes and management choices, this guide is intended to inform choices made by foresters at the standlevel only. The *Desired Condition* describes the forest habitat condition that is most desirable for each species and is followed by a table of tips and considerations for silvicultural options that have the potential to create or enhance habitat for the species. When it exists, a reference number to the corresponding Silviculture with Birds in Mind option (e.g. 1A) is provided, along with a rough estimate of when and for how long the desired condition is likely to persist post-treatment. This section is meant to be used as a quick reference for foresters in the field who would like ideas for how to protect or enhance habitat for particular species or are wondering how a particular treatment may impact a species.

Although birds are affected by both the landscape and

Notes on Massachusetts edition

The Massachusetts team altered the Vermont Birder's Dozen list by adding Black-and-white Warbler, Ruffed Grouse, and Eastern Towhee to the dozen and removing American Woodcock, Scarlet Tanager, and Blue-headed Vireo. The information for these new species was developed in the same manner as the information for the species in the original Vermont Birder's Dozen. The silviculture options Clearcut with retention and Clearcut with Reserves were also added to the Massachusetts document in the silviculture section of any of the birds that would benefit from it.

References

Hagenbuch, S., K. Manaras, J. Shallow, K. Sharpless, J. Shallow, and M. Snyder. 2011. Birds with Silviculture in Mind: Birder's Dozen Pocket Guide for Vermont Foresters. Audubon Vermont and the Vermont Department of Forests, Parks and Recreation.

This document is a derivative of the Audubon Vermont and Vermont Department of Forests, Parks, and Recreation Foresters for the Birds Toolkit. We made minor modifications to the Vermont toolkit to address Massachusetts forest conditions, priority birds, and forest management practices. The bird identification and habitat information in this guide was taken primarily from The Birds of North America, a web resource managed by the Cornell Lab of Ornithology. The information in the Silvicultural Considerations section reflects our own

integration and application of current research in the disciplines of bird habitat requirements and silviculture, along with our personal knowledge in these areas that has been developed through practice and field experience. In most cases, it is not based on primary research on the impacts of silvicultural treatments on bird populations, simply because there are still many unanswered questions in this area of study. As a result, the information in this section represents our best informed estimate of how silvicultural treatments influence, and have the potential to benefit, the species in the Birder's Dozen. We anticipate that the tips and considerations in this section will evolve as our understanding of how birds respond to silvicultural treatments develops.

Please contact Mass Audubon for a complete list of references used in the creation of this guide.

Non-Native Invasive Plant Species

Non-native, invasive plants, such as bush honeysuckles, buckthorn, autumn olive, and Japanese barberry, present a variety of threats to forest health in Massachusetts and the northeast. Although some species of native forest birds successfully use these shrubby, woody plant species as nesting sites and eat their fruits, the fruits generally have low nutritional value and the invasive plants reduce the diversity of other nesting and foraging options in forest ecosystems. In some cases, nest success has been shown to be lower in non-natives than in native vegetation. Overall, non-native, invasive plant species degrade the quality of native forest bird habitat in our region. Consideration and control of non-native, invasive plant species should be a management objective for every forester practicing in Massachusetts, and may affect opportunities for implementing silvicultural treatments discussed in this publication and its companion documents.

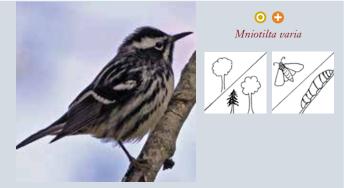
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The original project on which this publication was based was supported by the Northeastern Area State and Private Forestry, U.S. Forest Service and TogetherGreen, a National Audubon program with funding from Toyota. Thanks to all the foresters participating in the Foresters for the Birds project who provided feedback on the original document.

Black-and-White Warbler

BAWW





ID Tips Body streaked with bold black and white stripes; black wings highlighted by two wide, white wing-bars.

Song Males sing a high, thin, mechanical, repetitive song of weesa weesa weesa weesa weesa. Typically lasts 3 seconds.

Habitat Partially open mature or secondgrowth hardwood and mixedwood forests with 70% canopy cover; also uses swampy forests. Requires high density of large (>12.6 in dbh) trees and a dense understory (0-5' layer). Likes a high density of hardwood saplings and is negatively associated with pine saplings. Uses early-successional habitat during post-fledging period.

Nest Open cup on ground against shrub, tree, rock or stump; well-hidden. Composed of dry leaves, coarse grass, strips of inner bark, pine needles, and rootlets; lined with finer grasses, mosses.

Food Forages mainly for insects and caterpillars like a nuthatch along the trunks and limbs of trees.

Silvicultural Considerations

Desired Condition Maintain or create hardwood or mixedwood forest matrix with a mix of openings and young forest in early stages of regeneration (<20 years old), preferably near an alder swale or other shrub wetland.



Forest fragmentation should be avoided. As a breeding species, typically absent from woodlots under 18.5 acres.

Silvicultural Options	Silviculture with Birds in Mind Reference	Tips and Considerations	Duration of Desired Condition
Crop Tree Release – canopy gap formation	1A	Increase number of large diameter trees in the stand, create small patches of regeneration	10-15 years post-treatment
Intermediate Treatments	3B	Increase stand diameter, release advance regeneration	-
Variable Retention	1B	Increase growth and vigor of canopy trees	-
Shelterwood with Reserves	3A	Results in dense regeneration that may be used during post-fledging period. Best used to regenerate hardwoods or mixedwood.	5-10 years post-treatment
Clearcut with retention, Clearcut with Reserves	3C	Results in dense regeneration that may be used during post-fledging period. Retain legacy trees.	3-10 years post-treatment

Black-throated Blue Warbler

BTBW











250 ACRES



ID Tips Deep blue on top with black mask and throat; white wing-patch "handkerchief."

Song A thick & buzzy *I'm-so-la-zeee* with endnote rising.

Habitat Large, continuous tracts (250+ acres) of hardwood or mixedwood with 50-80% canopy cover and a dense understory (0-5' layer) of hobblebush and/or small saplings of sugar maple, American beech, striped maple, and softwoods.

Territory 2.5-10 acres (smaller in forests with a dense and diverse understory).

Nest Open cup of bark strips held together with spider web and saliva placed in the fork of a sapling or shrub in 0-5' layer.

Food Insectivorous, feeding largely on moth and butterfly larvae and adults.

Silvicultural Considerations

Desired Condition Maintain or create hardwood and mixedwood stands with 50-80% canopy cover and a dense understory (0-5' layer).

Silvicultural Options	Silviculture with Birds in Mind Reference	Tips and Considerations	Duration of Desired Condition
Crop Tree Release with Gap Formation	1A	Take all opportunities to protect advance regeneration.	3-15 years post-treatment
Mixed Intermediate Treatments	3B		
Expanding-gap Group Shelterwood	2A 2B	Keep group width < 2x the canopy height to maximize average stand canopy closure.	_
Group and Single Tree Selection	2.0		
Shelterwood with Reserves	3A	Greatest increase in understory density occurs between seed and removal cuttings.	_





ID Tips Bright yellow face, olive head and back; black throat drips down sides onto white belly; two white wing-bars.

Song To attract females, males sing zee-zee-zee-zoo-zee (also known as I'm-black-throated-green); to defend territorial boundaries zoo-zee-zoo-zoe (also known as trees-trees-murmuring-trees).

Habitat Prefers large, continuous tracts (250+ acres) of closed-canopy (>80% cover) softwood or mixedwood forests. Often strongly associated with red spruce in boreal forests and with eastern hemlock in non-boreal forests.

Territory Average of 1.6 acres in hemlock-beech forest in New York. Smaller in dense, softwood stands than in mixedwood stands.

Nest Open cup placed in crotch of shrub or within a group of thin vertical stems, typically 3-10 feet off ground.

Food Insectivorous; gleans from small branches and needles on conifers.

Silvicultural Considerations

Desired Condition Maintain or create well-stocked, uneven-aged mixedwood and softwood sawtimber stands with >80% canopy cover.

⚠ BTNW avoids road edges and forested openings up to ~650 feet from edge or opening.

Consider attempting to regenerate softwoods on sites dominated by red maple which may be present as a result of heavy softwood cutting in the past.

A Retain softwood inclusions in hardwood stands; favor red spruce and eastern hemlock.

Silvicultural Options	Silviculture with Birds in Mind Reference	Tips and Considerations	Duration of Desired Condition
Crop Tree Release with Gap Formation	1A	Use to enhance weak softwood component and establish new softwood regeneration.	5+ years post-treatment
Single Tree Selection		Use to enhance uneven-aged structure.	-
Variable Retention Thinning	1B	Use to enhance weak softwood component.	-
Mixed Intermediate Treatments	3В		

Canada Warbler CAWA





ID Tips Necklace of black stripes on bright yellow throat and belly; complete white eye-ring.

Song Often has soft introductory chips, then *I'm-IN-here*, *but-you-CAN'T-SEE-ME*.

Habitat Most abundant in moist, mixedwood forests with a 50-70% canopy cover and dense understory (0-5') and midstory (6-30'). Often found in swamps, riparian areas, and upland forests with mossy hummocks, root masses, and downed logs.

Territory Males arrive before females and defend small (~0.6 acre) territory until nesting begins. After nesting begins, males found roaming over larger (2-3 acre) area in New York.

Nest Open cup on or near ground on mossy hummock, stump or log, or upturned tree roots.

Food Flying insects and spiders.

Silvicultural Considerations

Desired Condition Maintain or create mixedwood stands with 50-70% canopy cover, a dense understory (0-5') and midstory (6-30'), and an uneven forest floor.

Leave as much woody debris on site as possible, and do not disturb tipups or logs in or near wet areas during harvest.

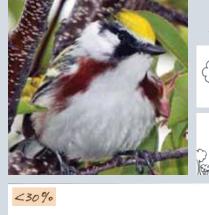
Avoid operating in forested wetlands and riparian areas.

A Retain softwood inclusions in hardwood stands.

Silvicultural Options	Silviculture with Birds in Mind Reference	Tips and Considerations	Duration of Desired Condition
Crop Tree Release with Gap Formation	1A	Take all opportunities to protect advance regeneration of seedlings and saplings.	Dense understory and midstory: 3-20 years
Mixed Intermediate Treatments	3B	Use to enhance weak softwood component and to establish new softwood regeneration.	post-treatment Enhanced softwood component: 5+ years
Expanding-gap Group Shelterwood	2A 2B	Locate groups to release advance softwood regeneration in hardwood stands.	post-treatment
Group and Single Tree Selection	25		
Shelterwood with Reserves	3A	Greatest increase in understory density occurs between seed and removal cuttings.	-

Chestnut-sided Warbler

CSWA











ID Tips Yellow crown, black moustache stripe and chestnut sides following contour of wings; tail held cocked above wingtips.

Song Fast Please-pleased-to-meet*cha* with emphatic ending.

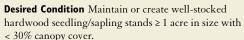
Habitat Young (5-15 years old) hardwood forest with <30% canopy cover and dense shrubs and saplings 3-10 feet high for nesting and foraging. Some larger saplings used as singing perches and to obscure nests.

Territory 2 - 2.5 acres

Nest Open cup placed in crotch of small shrub or within a group of smalldiameter, vertical stems less than 6.5 feet off the ground.

Food Insectivorous; prefers caterpillars and fly larvae.

Silvicultural Considerations

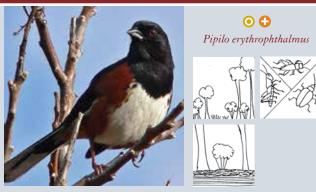




Areas that will be maintained as open-canopy, early-successional habitat should be cut on a 7-10 year cycle.

Silvicultural Options	Silviculture with Birds in Mind Reference	Tips and Considerations	Duration of Desired Condition
Group and Single Tree Selection	2B	Openings of at least 1 acre in size are more likely to attract a nesting pair	3-10 years post-treatment
Clearcut, Clearcut with Reserves	3C	Retain native shrubs for nesting structure post- treatment. Retain <30% crown cover Also need to retain small scattered trees for singing perches	
Shelterwood with Reserves	3A	Most appropriate in hardwood or mixedwood sites	
Shelterwood		Desired condition may persist for several years post-removal cuttings	

Eastern Towhee EATO





ID Tips Bold sooty black above and on throat; sides warm rufous and belly white. Shows white in the tail in flight.

Song Song is a loud *drink-your-teeea!* lasting about 1 second. Call is a bold che-wink.

Habitat Occupies early successional open or edge habitats; requires dense brushy understory (0-5' layer) and well-developed litter layer. Open-canopy (~20% canopy cover) woodlands required.

Territory 0.65 acres in pine barrens in se. Massachusetts. 4 acres in moist oak forests and 3 acres in dry pine-oak forests in New Jersey.

Nest On or near ground in brushy cover or low in a shrub. Open cup made of bark strips, grapevine bark, twigs, dead leaves, and leaf stems. Lined with fine grasses, rootlets, or animal hair.

Food Omnivorous; seeds, fruits, and invertebrates. Often scratches noisily through leaf litter.

Silvicultural Considerations

Desired Condition Maintain young forest habitat with few standing trees and dense brushy understory. This species will benefit from larger (>5 acres) more complete cuts.

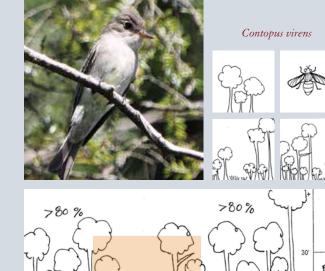


Areas that will be maintained as open-canopy, early-successional habitat should be cut on a 7-10 year cycle.

Silvicultural Options	Silviculture with Birds in Mind Reference	Tips and Considerations	Duration of Desired Condition
Shelterwood with Reserves	3A	Lower canopy cover and BA preferable to this species. Most appropriate in hardwood or mixedwood sites	5-10 years post-treatment
Clearcut with retention, Clearcut with Reserves	3C	Retain native shrubs for nesting structure	3-10 years post-treatment

Eastern Wood-Pewee

EAWP



ID Tips A flycatcher; slender, small headed, and grayish-olive above with dull, white wing-bars; "sallies" for insects (flying out from perch and then back again).

Song Plaintive *pee-ahh-weee*.

Habitat Hardwood forests with closed (>80%) canopy cover and open midstory (6-30' layer) near openings and edges.

Territory Variable: 1.4-3.1 acres in lowland forest in Illinois and average of 19.3 acres in forest stands in Wisconsin.

Nest Shallow cup of woven grass covered on outside with lichens placed on the horizontal limb of a tree.

Food Insectivorous; primarily catches flying insects taken in the air on forays from a prominent perch.

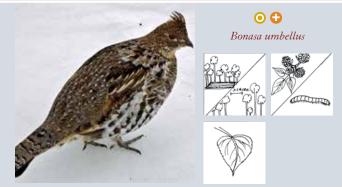
Silvicultural Considerations

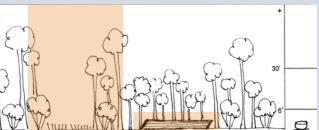
Desired Condition Maintain or create hardwood pole/sawtimber stands with >80% canopy cover, gaps, and open midstory (6-30' layer) near forest openings and edges.

Silvicultural Options	Silviculture with Birds in Mind Reference	Tips and Considerations	Duration of Desired Condition
Crop Tree Release with Gap Formation	1A	Gaps and/or open midstory create foraging opportunities.	1-30 years post-treatment
Variable Retention Thinning	1B	-	
Expanding-gap Group Shelterwood	2A		
Group and Single Tree Selection	2B		
Mixed Intermediate Treatments	3B		

Ruffed Grouse (also known as Partridge)

RUGR





ID Tips Chicken-sized game bird; intricately patterned with dark bars and spots on either a reddish-brown or grayish background; tail thinly barred with one thick black bar near the tip; crested head.

Song In spring male produces a low, rhythmic "drumming" sound on downed timber.

Habitat Closely associated with quaking aspen; brushy, mixed-age woodlands, successional to mature hardwood and mixed forests. Dense understory (0-5' layer) and fairly open herbaceous ground cover needed for hens with broods. Males require drumming sites in dense hardwood saplings. More mature woodlands used in winter.

Nest An excavated bowl on dry ground under dense cover at the base of a tree or solid object; lined with bits of vegetation; very often near opening and close to a water source.

Food insects, fruit, leaves; buds of birch, aspen, hazel, hophornbeam, and cherry in winter.

Silvicultural Considerations

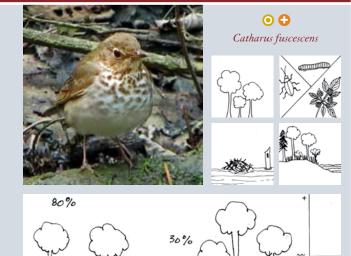
Desired Condition Maintain or create hardwood or mixedwood forest matrix with a mix of openings and young forest in early stages of regeneration (<20 years old). Retain downed wood for drumming sites.

⚠ Requires presence of small clearings (< 1 acre).

A Retain downed logs or snags for drumming sites.

Silvicultural Options	Silviculture with Birds in Mind Reference	Tips and Considerations	Duration of Desired Condition
Crop Tree Release with Canopy Gap Formation	1A	Retain some aspen, cherry and birch when present	3-5 years post-treatment
Expanding-Gap Group Shelterwood	2A	Retain coarse woody material in gaps for drumming	5-10 years post-treatment
Variable-Retention Thinning	1B	Create open, mature woods with areas of regeneration	3-5 years post-treatment
Small-Group and Single-Tree Selection	2B		
Mixed Intermediate Treatments	3B		
Shelterwood with Reserves	3A	Regenerate aspen if present. Retain woody material for drumming.	5-10 years post-treatment
Clearcut, Clearcut with Reserves	3C	Locate near open, mature woods.	5-15 years post-treatment

VEER Veery



ID Tips Tawny-brown above, weakly spotted on breast; least spotted of all the thrushes.

Song Flute-like and ethereal; ball spiraling down a tube; call an emphatic veer!

Habitat Damp, hardwood forest with intermediate (30-80%) canopy cover and a dense understory (0-5' layer). Often associated with riparian areas, regenerating forests, and beaver wetlands.

Territory 0.25 to 7.5 acres in Connecticut.

Nest Cup of dead leaves, bark, and mud-like leaf mold lined with fine fibers placed on ground or in a low shrub or brush pile.

Food Insects, spiders, centipedes, pill bugs, and fruits. Primarily forages on the ground, but also in the foliage.

Silvicultural Considerations

Desired Condition Maintain or create hardwood stands with 30-80% canopy cover and a dense understory (0-5' layer) proximate to wetlands and/or riparian areas.

A Maintain closed-canopy buffers along beaver ponds, wetlands, and riparian areas.



Leave as much slash, stumps, tip-ups, and woody debris on site as possible to provide shelter and nest sites; delimb trees where felled.

Silviculture with Birds in Mind Reference	Tips and Considerations	Duration of Desired Condition
1A	Take all opportunities to protect advance regeneration.	3-15 years post-treatment
2B		
3B	Encourage coppicing where appropriate to increase understory density.	_
2A	Greatest increase in understory density occurs between seed and removal cuttings.	_
3A		
	uith Birds in Mind Reference 1A 2B 3B	Tips and Considerations 1A Take all opportunities to protect advance regeneration. 2B 3B Encourage coppicing where appropriate to increase understory density. 2A Greatest increase in understory density occurs between seed and removal cuttings.

White-throated Sparrow

WTSP











ID Tips White throat with yellow in front of eyes; white and black or buff and brown stripes on head; gray chest.

Song Clear whistled, *Poor Sam Peabody Peabody Peabody*.

Habitat Softwood and mixedwood forests containing young forest openings with <50% canopy cover and dense 0-5' layer for cover.

Territory 0.5 - 2.5 acres in Ontario. Males are known to forage in a surrounding area at least three times the size of defended territories.

Nest Open cup placed on or just above ground along the edge of an opening.

Food Primarily insects, greens, and fruits foraged from vegetation (low shrubs and lower branches of conifers) and on the ground; also seeds. Prefers to forage along the edges of openings near dense cover.

Silvicultural Considerations

Desired Condition Maintain or create uneven-aged mixedwood and softwood sawtimber stands containing openings with <50% canopy cover and dense understory (0-5' layer).

⚠ Leave as much slash, stumps, tip-ups, and woody material along edges of openings as possible to provide cover.

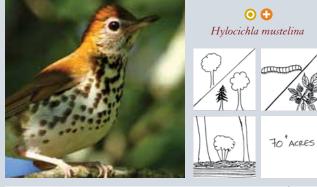
Maintain closed-canopy buffers along beaver ponds, wetlands, and riparian areas.

A Retain softwood inclusions in hardwood stands.

Areas that will be maintained as open-canopy, earlysuccessional habitat should be cut on a 7-10 year cycle.

Silvicultural Options	Silviculture with Birds in Mind Reference	Tips and Considerations	Duration of Desired Condition
Expanding-gap Group Shelterwood	2A	Locate groups to release advanced softwood regeneration in hardwood stands.	Dense understory: 3-15 years
Group and Single Tree Selection	2B		post-treatment Enhanced softwood
Clearcut with Patch Retention	3C	WTSP is more likely to use retained patches than harvested openings. Retain at least a 0.5 acre patch for every 10 acres harvested.	5+ years post-treatment
Shelterwood with Reserves	3A	Desired condition exists between seed and removal cuttings, and may persist for a few years in reserves post-removal cuttings.	
Shelterwood		Desired condition exists between seed and removal cuttings.	

Wood Thrush WOTH





ID Tips Brown back, heavily spotted on white breast; large thrush a little smaller than an American Robin.

Song A flute-like ee-oh-layyy, ending in a sound like shattering glass.

Habitat Interior and edges of hardwood and mixedwood forest. Prefers stands with canopy >50 feet in height, a diversity of hardwood tree species, moderate mid-canopy closure and shrub density, shade, fairly open forest floor, moist soil, and decaying leaf litter.

Territory 0.2 - 7 acres.

Nest Open cup of leaves and grasses lined with mud, placed on lower limb of a tree or shrub 10-13 feet off the ground and well-hidden among leaves in a shady area.

Food Mostly soil invertebrates; some fruits. Primarily forages on ground in leaf litter or on semi-bare ground under forest canopy.

Silvicultural Considerations

Desired Condition Maintain or create well-stocked, uneven-aged, sawtimber hardwood stands with >80% canopy cover and moist leaf litter.

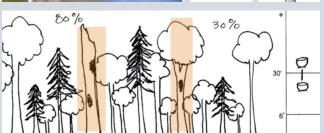
⚠ WOTH are area sensitive. In a heavily forested (90+%) landscape, a patch of at least 70 acres is needed for successful breeding. Larger patches are needed in less forested landscapes.

Avoid disturbance and desiccation of leaf litter and soil conditions; consider operating in winter.

Silvicultural Options	Silviculture with Birds in Mind Reference	Tips and Considerations	Duration of Desired Condition
Crop Tree Release with Gap Formation	1A	Favor a diversity of hardwood species.	5+ years post-treatment
Mixed Intermediate Treatments	3B		
Variable Retention Thinning	1B	Retain a diversity of vigorous hardwoods.	<u> </u>

YBSA





ID Tips Messy barring on back; yellowish wash across belly. Vertical white stripe on side distinguishes it from other woodpeckers.

Song Drum burst of 5 rapid taps followed by gradual slowing double taps; call a *QUEEah*.

Habitat Hardwood and mixedwoods with high percentage of intolerant species, especially aspen and birch. Requires hardwood trees with central decay column for nest cavities.

Territory Variable. Average of 5 acres in Ontario.

Nest Cavity in dead or live tree with central decay column. Prefers quaking aspen ≥ 13 inches dbh infected with the heartwood decay fungus *Fomes igniarius var. populinus*.

Food Sap from a diversity of woody plant species, insects, inner bark and cambium layers, fruits, and seeds. Drills and maintains sap wells along trunk below crown and above lowest living branches.

Silvicultural Considerations

Desired Condition Maintain or create hardwood and mixedwood sawtimber stands with 30-80% canopy cover and some dead and dry, or live hardwood trees with central decay for nest sites.

⚠ Retain as many live and dying aspen and birch ≥ 13 inches dbh as possible – particularly along forest edges. Leave snags and cavity trees in clusters or in untreated areas.

A Recruit dry snags through girdling if suitable snags for nesting are lacking.

⚠ Don't cut all large, unmerchantable trees and retain some large, healthy trees that are not hollow or damaged to develop into suitable nest trees in the future.

Silvicultural Options	Silviculture with Birds in Mind Reference	Tips and Considerations	Duration of Desired Condition
Clearcut with Patch Retention		Retain existing and potential future nest trees along edges of cut and retained patches.	0+ years post-treatment
Shelterwood with Reserves	3A	Retain existing and potential future nest trees along edges of cut (and reserves).	0-15 years post-treatment
Shelterwood		Desired condition exists between seed and removal cuttings when canopy is 30-80% closed.	
Variable Retention Thinning	1B	Retain existing and potential future nest trees; consider girdling 13+ inch dbh UGS to recruit snags.	0+ years post treatment

Stand-level Habitat Associations

Note that birds may be found in a wider variety of conditions than indicated here.
*Taken from Forest Stand Dynamics (Oliver and Larson 1990).

STAND BIRD SPECIES

Development Stage*	Structure	Deciduous to Mixed Forest	Coniferous to Mixed Forest White-throated sparrow		
Stand establishment	Young forest, 5-15 years following stand-replacing disturbance	Eastern Towhee Chestnut-sided Warbler Ruffed Grouse			
Stem exclusion	Structurally simple stand with single foliage stratum		Ruffed Grouse		
Understory reinitiation	Closed-canopy (>80% canopy cover) forest with moderate density of understory trees and shrubs	Black-and-white Warbler Black-throated Blue Warbler Eastern Wood-Pewee Wood Thrush	Black-throated Green Warbler		
Late-successional, transition old growth, or old growth	Vertically and horizontally diverse stand with canopy gaps, multiple foliage layers, large trees, snags, and logs. Canopy cover varies spatially within stand; remains >80% in patches	Black-and-white Warbler Black-throated Blue Warbler Canada Warbler Eastern Wood-Pewee Ruffed Grouse Wood Thrush Yellow-bellied Sapsucker	Black-throated Green Warbler Canada Warbler White-throated Sparrow		

Table of Massachusetts Nesting Dates

Note that there are other forest songbird species that begin breeding earlier or end breeding later than those shown here. Reference: Massachusetts Breeding Bird Atlas 2

Bird Species	Nesting Dates	APRIL	MAY	JUNE	JULY	AUGUST
Black-and-white Warbler	25 May - 1 Aug					
Black-throated Blue Warbler	25 May - 10 Aug					
Black-throated Green Warbler	25 May - 5 Aug					
Canada Warbler	5 Jun - 1 Aug					
Chestnut-sided Warbler	25 May - 1 Aug					
Eastern Towhee	1 May - 10 Aug					
Eastern Wood-Pewee	5 Jun - 1 Aug					
Ruffed Grouse	15 May - 30 Jul					
Veery	25 May - 10 Aug					
White-throated Sparrow	20 May - 20 Aug					
Wood Thrush	25 May – 10 Aug					
Yellow-bellied Sapsucker	20 May – 10 Aug					



Black-and-white WarblerThe Black-and-white Warbler is the only member of the genus *Mniotilta*.
The genus name means "moss-plucking," a reference to its habit of

probing bark and moss for insects.



Black-throated Blue WarblerMales and females look so different that they were originally thought to be two different species.



Black-throated Green Warbler
The male black-throated green
warbler tends to sing his "zee-zee-zee-zoo-zee" song near the middle
of his territory, largely in the
beginning of the breeding season
to attract females. He sings the
"zoo-zee-zoo-zoo-zee" song mostly
around the territory's margins to
deter other males.



Canada Warbler
Not much is known about the mating system of the Canada warbler, but it appears to be monogamous. The observation of male-female pairs in Panama during fall and spring migration suggests that the pair may stay together year round.

Spends relatively little time on breeding grounds; one of the last warblers to arrive in spring and first to depart after nesting cycle.



Chestnut-sided Warbler
Males sing two different songs.
The well-known song, generally described as *Please, please, pleased to meetcha*, belongs to the accented-ending class of songs and is used before the arrival of females and early in the nesting cycle; it is believed to be used to attract females. Unaccented-ending songs, a second class, are used as the nesting cycle progresses and in aggressive encounters against

The two song classes are learned separately. Birds require visual contact with tutor males to fully develop their repertoires.

other males.



Eastern Towhee

Eastern Towhees tend to be pretty solitary, and they use a number of threat displays to tell other towhees they're not welcome. You may see contentious males lift, spread, or droop one or both wings, fan their tails, or flick their tails to show off the white spots at the corners. Studies have shown that male towhees tend to defend territories many times larger than needed simply to provide food.

develop their repertoires.

Cool Facts



Eastern Wood-Pewee

Pewees weave their nests out of grass and cover the outside in lichens so that the nest resembles a knot on the tree branch on which it sits. Since the nests are so well-camouflaged and are often up to 60 feet off the ground, little is known about the breeding biology of this species.



Ruffed Grouse

The male Ruffed Grouse's signature drumming display doesn't involve drumming on anything but air. As the bird quickly rotates its wings forward and backward. The air that rushes into the temporary vacuum beneath the wings creates a miniature vacuum, generating a deep, thumping sound wave that carries up to a quarter of a mile.



Veery

A study of migration using radio telemetry showed that the veery can fly up to 285 km (160 mi) in one night, and that it can fly at altitudes above 2,000 m (1.2 mi).



White-throated Sparrow

The oldest recorded white-throated sparrow was 9 years 8 months old.



Wood Thrush

Thrushes have a complicated syrinx (song box) that allows them to sing two notes at the same time and harmonize with their own voice.



Yellow-bellied Sapsucker

The yellow-bellied sapsucker makes two kinds of holes in trees to harvest sap. Round holes extend deep in the tree and are not enlarged. The sapsucker inserts its bill into the hole to probe for sap. Rectangular holes are shallower, and must be maintained continually for the sap to flow. The sapsucker licks the sap from these holes, and eats the cambium of the tree too. New holes usually are made in a line with old holes, or in a new line above the old.

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Key to Symbols



⚠ Caution!

A consideration or tip that is especially important for this species.

State of the Birds Ranking

Using the data from the Massachusetts Breeding Bird Atlas 2, Mass Audubon assigned conservation status ranks to the bird species that breed in Massachusetts.

- Species is likely decreasing in Massachusetts. Continued action/monitoring needed
- Species is showing a strong decline in Massachusetts. Conservation action urgent.

← Massachusetts Conservation Species of Greatest **Conservation Need**

A bird species that has been identified by the Massachusetts Division of Fisheries and Wildlife as being in greatest conservation need in the state of Massachusetts due to rarity, population decline, and/or vulnerability to habitat loss from threats such as fragmentation, forest succession, invasive species, and/or conversion.

Birder's Dozen Species also Listed as Massachusetts Species of Greatest Conservation Need include:

Canada Warbler

Eastern Towhee

Ruffed Grouse

White-throated Sparrow

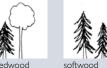
Wood Thrush

Key to Habitat Feature Icons

Forest Type











Food







butterflies



caterpillars





grasshoppers





spiders



flying insects







soil invertebrates



sap and cambium

Associated Wood Species



alder, birch and aspen



quaking aspen



hobblebush



eastern hemlock and red spruce



Other



requires multiple habitat types near each other

singing perch

in opening



area sensitive; requires large forested patches

perch on edge

of opening



forested wetlands

opening/edge



riparian areas



beaver wetlands



floor



uneven forest opening in forest matrix



thick leaf litter



snag or cavity tree



drumming log

Atlantic Flyway Eastern Forest Priority Birds Breeding in Massachusetts

This list contains forest bird species that have been determined by the National Audubon Society to be of conservation priority in the Northern Forest Biome and the Eastern Deciduous Forest Biome in the Atlantic Flyway. These species are included because they have a large proportion of their global population within one of the biomes and may be declining in their breeding range. Massachusetts is part of both the Northern Forest Biome and the Eastern Deciduous Forest Biome.

Colors correspond to the species Massachusetts State of the Birds ranking.

- No Action Strong Increase
- No Action Likely Increase
- Monitor to Ensure Stability
- Continued Action/Monitoring Needed
- Conservation Action Urgent
- Not enough information to rank

Young Hardwood and Mixedwood Forest

- American Woodcock
- Canada Warbler*
- Chestnut-sided Warbler*
- Magnolia Warbler
- Mourning Warbler
- Nashville Warbler
- Northern Flicker
- Ruffed Grouse*
- White-throated Sparrow*
- Eastern Towhee*
- Least Flycatcher
- White-eyed Vireo
- Blue-winged Warbler
- Carolina Wren

Mature Hardwood and Mixedwood Forest

- American Redstart
- Blackburnian Warbler
- Black-throated Blue Warbler*
- Black-throated Green Warbler*
- Blue-headed Vireo
- Chimney Swift
- Eastern Wood-Pewee*
- Northern Parula
- Ovenbird
- Purple Finch
- Scarlet Tanager
- Veery*
- Wood Thrush*
- Yellow-bellied Sapsucker*
- Black-and-white Warbler*

- Northern Saw-whet Owl
- Dark-eyed Junco
- Red-shouldered Hawk
- Tufted Titmouse
- Red-bellied Woodpecker
- Pine Warbler

Boreal/High Elevation Forest

- Blackpoll Warbler
- Yellow-bellied Flycatcher

Wetlands and Watercourses

- Alder Flycatcher
- Swamp Sparrow
- Louisiana Waterthrush

* Birder's Dozen species.

To learn more about these species, check out the Massachusetts Breeding Bird Atlas 2, found at www.massaudubon.org/birdatlas/bba2.





